



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

*[Signature]*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,025	08/07/2003	Leif Fredin	065823.0110	1031
23640	7590	03/16/2004	EXAMINER	
BAKER BOTTS, LLP 910 LOUISIANA HOUSTON, TX 77002-4995			ALLEN, DENISE S	
		ART UNIT		PAPER NUMBER
		2872		

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/636,025	FREDIN ET AL.
	Examiner	Art Unit
	Denise S Allen	2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-9 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-9 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 07 August 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/7/03.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the second detector positioned to receive radiation backscattered by the optical fiber (claim 8) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figure 3 references 72 and 76. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities: the repeated use of the symbol “□” (i.e. page 13 line 6 and page 16 line 4) is unclear because its meaning is not defined.

Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the second detector positioned to receive radiation backscattered by the

optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector (claim 8 lines 1 – 4) is not disclosed in the specification.

*Claim Objections*

Claims 3 and 9 are objected to because of the following informalities:

The limitations “the external modulator” (claim 3 line 1), “the first duration” (claim 3 lines 2 – 3), “the first frequency” (claim 3 line 3), and “the second frequency” (claim 3 lines 3 – 4) lack antecedent basis because they have not been previously recited in claim 1 or 3. Suggested correction: make claim 3 dependent on claim 2.

There is no period, “.”, at the end of claim 9. For the purpose of examination claim 9 is interpreted to be complete.

Appropriate correction is required.

*Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The second detector positioned to receive radiation backscattered by the optical fiber (claim 8 lines 1 – 4) is not properly described in the application as filed. Figure 3 clearly shows the first detector (reference 58) but contains no second detector. Figure 6 also show the first detector and also includes an additional detector (reference 56); however this additional detector is positioned to receive radiation directly from the laser (reference 50) by means of the splitter (reference 70) and not positioned to receive radiation backscattered by the optical fiber (reference 74). If reference 56 is the second detector recited in claim 8, the application fails to describe how the backscattered radiation is directed from the optical fiber to the detector. Further if reference 56 is not the second detector recited in claim 8, the application fails to describe how the second detector is positioned relative to the first detector and how the backscattered radiation is directed to both the first and second detectors.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationships between the second detector and each of the first detector, the optical fiber, and the backscattered radiation. Inclusion of these relationships is essential because the only additional (and potentially second) detector (Figure 6 reference 56) disclosed is positioned such that it cannot receive radiation backscattered by the optical fiber. For the purpose of examination, the second detector is interpreted to be a detector other than the detectors disclosed in the specification and positioned adjacent to the first detector.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 6, 7, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wong et al (US 5,062,703).

Regarding claim 1, Wong et al teaches a system for measuring optical characteristics comprising: a laser (reference 14, column 5 lines 27 – 30) producing an excitation signal (column 5 lines 36 – 39); a single-mode optical fiber (reference DUT, column 4 lines 64 – 66) coupled (by reference 26) to the laser so that a coupled excitation signal (reference V<sub>i</sub>) is introduced into the optical fiber, wherein the coupled excitation signal is a continuous wave signal (column 5 lines 16 – 17) modulated at variable frequencies (column 9 line 21); a first detector (reference 16B) positioned to receive radiation backscattered (V<sub>r</sub>) by the optical fiber in response to the coupled excitation signal (column 7 lines 36 – 40).

Regarding claim 2, Wong et al teaches an external modulator (Figure 10 “MODULATOR”) coupled between the laser and the optical fiber and operating to modulate the intensity of the excitation signal at a frequency that varies linearly (Figure 10A) from a first frequency ( $\omega_{m1}$ ) to a second frequency ( $\omega_{m2}$ ) over a first duration.

Regarding claim 4, Wong et al teaches a laser driver (reference 20) coupled to the laser and operating to modulate the intensity of the excitation signal at a frequency that varies linearly (Figure 10A) from a first frequency ( $\omega_{m1}$ ) to a second frequency ( $\omega_{m2}$ ) over a first duration.

Regarding claim 6, Wong et al teaches the coupled excitation signal is modulated at a first discrete frequency for a first duration (column 61 lines 18 – 23) and modulated at a second discrete frequency (column 61 lines 24 – 27), different from the first discrete frequency (column 11 lines 21 – 25), for a second duration by an external modulator (Figure 10 “MODULATOR”) coupled between the laser and the optical fiber.

Regarding claim 7, Wong et al teaches the coupled excitation signal is modulated at a first discrete frequency for a first duration (column 61 lines 18 – 23) and modulated at a second discrete frequency (column 61 lines 24 – 27), different from the first discrete frequency (column 11 lines 21 – 25), for a second duration by a laser driver (reference 20) coupled to the laser.

Regarding claim 9, Wong et al teaches an analog to digital converter that converts the output of the first detector from analog to digital format (column 10 lines 59 – 64).

Claims 1 – 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Derickson et al (Fiber Optic Test and Measurement).

Regarding claim 1, Derickson et al teaches a system (Figure 10.28) for measuring optical characteristics comprising: a laser (“Sinusoidally Modulated Source”, page 424 lines 17 – 18)) producing an excitation signal (page 424 lines 7 – 8); a single-mode optical fiber (“Test Device”, page 424 line 8) coupled (at “3dB”) to the laser so that a coupled excitation signal is introduced into the optical fiber, wherein the coupled excitation signal is a continuous wave signal (page 424 lines 21 – 25) modulated at variable frequencies (page 424 lines 9 – 10); a first detector (“High-frequency Receiver”) positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal (page 424 lines 8 – 10).

Regarding claim 2, Derickson et al teaches an external modulator (page 424 line 17) coupled between the laser and the optical fiber and operating to modulate the intensity of the excitation signal at a frequency that varies linearly from a first frequency to a second frequency over a first duration (page 425 lines 7 – 8, see Figure 10.29 for an example of a linearly chirped frequency).

Regarding claim 3, Derickson et al teaches external modulator modulates the intensity of the excitation signal over a second duration immediately following the first duration at a frequency that varies linearly from the first frequency to the second frequency (page 425 lines 7 – 8, see Figure 10.29 for an example of a linearly chirped frequency which shows repeats).

Regarding claim 4, Derickson et al teaches a laser driver (“Vector Network Analyzer” by means of “stimulus”) coupled to the laser and operating to modulate the intensity of the excitation signal at a frequency that varies linearly from a first frequency to a second frequency over a first duration (page 425 lines 7 – 8, see Figure 10.29 for an example of a linearly chirped frequency).

Regarding claim 5, Derickson et al teaches the laser driver modulates the intensity of the excitation signal over a second duration immediately following the first duration at a frequency that varies linearly from the first frequency to the second frequency (page 425 lines 7 – 8, see Figure 10.29 for an example of a linearly chirped frequency which shows repeats).

Regarding claim 6, Derickson et al teaches the coupled excitation signal is modulated at a first discrete frequency for a first duration and modulated at a second discrete frequency, different from the first discrete frequency, for a second duration (page 424 lines 8 – 10) by an external modulator (page 424 line 17) coupled between the laser and the optical fiber.

Regarding claim 7, Derickson et al teaches the coupled excitation signal is modulated at a first discrete frequency for a first duration and modulated at a second discrete frequency, different from the first discrete frequency, for a second duration (page 424 lines 8 – 10) by a laser driver (“Vector Network Analyzer” by means of “stimulus”) coupled to the laser.

Regarding claim 9, Derickson et al teaches an analog to digital converter that converts the output of the first detector from analog to digital format (“Vector Network Analyzer”).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong et al.

Wong et al teaches the system as described above. Wong et al does not teach a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector in the system of Wong et al in order to extend the range of measurable wavelengths and improve the resolution of the measurement (column 11 lines 16 – 25).

Art Unit: 2872

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Derickson et al.

Derickson et al teaches the system as described above. Derickson et al does not teach a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector in the system of Derickson et al in order to extend the range of measurable wavelengths and improve the resolution of the measurement (page 424 lines 12 – 13).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (571) 272-2305. The examiner can normally be reached on Monday - Friday, 9:00am - 5:30pm.

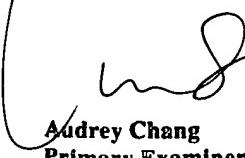
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Denise S Allen  
Examiner  
Art Unit 2872

  
Audrey Chang  
Primary Examiner  
Technology Center 2800

  
dsa